

UNITED STATES PATENT APPLICATION

of

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for

Air Freshener and Method

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Your petitioners,

Alan J. Wheatley (whose residence is Draper, Utah), and

Christopher D. Anderson (whose residence is South Jordan, Utah);

citizens of the United States, pray that letters patent may be granted to them as the inventors
of an **Air Freshener and Method** as set forth in the following specification.

Air Freshener and Method

This application claims the benefit of U.S. Provisional Application Serial Nos. 60/451,135, filed February 28, 2003, and 60/517,030, filed November 3, 2003.

5 BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to air fresheners and the like.

Related Art

10 Air fresheners are common devices used to improve and/or change the olfactory characteristics of an environment. Such environments can include bathrooms or wash closets, vehicles, lockers, drawers, etc. Such air fresheners typically include a scent that is aesthetically pleasing, such as flowers, fruits, etc.

One common type of air freshener is a two-dimensional, paper-fiber card with a
15 fragrance surrounded in a clear plastic envelope. The envelope is pierced to form an opening, and a portion of the freshener protrudes through the opening to release a scent. The air freshener includes a string or elastic forming a loop to suspend the air freshener. Such air fresheners are commonly utilized in vehicles. One disadvantage with such air fresheners is that the card is moist, and can leak or leach, leaving a stain on other surfaces, such as dashboards. The plastic
20 envelope and the suspending loop act to resist contact between the card, and other surfaces. Another disadvantage with such air fresheners is that they are aesthetically displeasing. Another disadvantage with such air fresheners is that they have a more pronounced and immediate scent release, releasing a majority of the scent in the first few days of use.

Another common type of air freshener has a disc-shaped shell or canister with a scented
25 disc or gel inside. The shell can include an adhesive strip to stick or adhere the shell to a surface. One disadvantage with such air fresheners is that removal of the shell often leaves a residue of the adhesive on the surface, which is aesthetically displeasing. In addition, the scented material can leak and harm the surface.

Some disadvantages of common air fresheners include 1) rapid scent loss or lack of
30 longevity; 2) non-linear or inconsistent scent release over time; and 3) risk of staining. Some air fresheners disperse their scent too rapidly, thus losing effectiveness over time, and not lasting as long as desired. Some air fresheners quickly or rapidly disperse their scent after activation, and then slowly release scent, or release little scent, thereafter. Some air fresheners include materials that can leak and stain.

Another disadvantage with some air fresheners is that they include a non-solid and non-liquid material, or a jelly-like material, that must be contained in some type of container because the jelly is flowable. The material can become dried and cracked over time, presenting an aesthetically displeasing appearance. Again, the scented material can leak and damage surfaces.

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SUMMARY OF THE INVENTION

It has been recognized that it would be advantageous to develop an air freshener that is more aesthetically pleasing. In addition, it has been recognized that it would be advantageous to develop an air freshener that is easily located or positioned without marring or otherwise
10 damaging other surfaces. In addition, it has been recognized that it would be advantageous to develop an air freshener that can last for a desired length of time, such as 30 days, and that can have a more constant scent release.

The invention provides an air freshener device with a scent material interspersed within a flexible and resilient polymer body. The polymer body is compressible under an applied force
15 and substantially returnable to an original configuration upon removal of the applied force. The scent material is capable of dispersing out of the body to surrounding air. In accordance with one aspect of the present invention, a polymer body can be a coherent elastomer having a freestanding, self-supported, three-dimensional shape. In accordance with another aspect of the present invention, the air freshener can have a clingy or tacky attachment surface to contact and
20 cling to a support surface by mechanical or specific adhesion.

Additional features and advantages of the invention will be apparent from the detailed description which follows, taken in conjunction with the accompanying drawings, which together illustrate, by way of example, features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an air freshener in accordance with an embodiment of the present invention;

FIG. 2 is a side view of the air freshener of FIG. 1;

FIG. 3 is a top view of the air freshener of FIG. 1;

FIG. 4 is a cross-sectional view of the air freshener of FIG. 1;

FIG. 5 is a side view of the air freshener of FIG. 1 shown disposed on a curved surface and being compressed by a force;

FIGs. 6 and 7 are schematic views of a method for making the air freshener of FIG. 1;

FIG. 8 is a side view of an air freshener in accordance with an embodiment of the present invention;

FIG. 9 is a perspective view of an air freshener in accordance with an embodiment of the present invention;

5 FIG. 10 is an exploded view of the air freshener of FIG. 9;

FIG. 11 is a cross-sectional side view of the air freshener of FIG. 9;

FIG. 12 is a cross-sectional side view of an air freshener in accordance with an embodiment of the present invention;

10 FIG. 13 is a cross-sectional side view of an air freshener in accordance with an embodiment of the present invention;

FIG. 14 is a schematic representation of a graph of scent release over time of an air freshener in accordance with an embodiment of the present invention;

FIG. 15 is a perspective view of the air freshener of FIG. 1;

15 FIG. 16 is a perspective view of a plurality of air fresheners in accordance with an embodiment of the present invention;

FIG. 17 is a top view of a plurality of air fresheners in accordance with an embodiment of the present invention; and

FIG. 18 is a perspective view of another air freshener in accordance with an embodiment of the present invention.

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DETAILED DESCRIPTION

Reference will now be made to the exemplary embodiments illustrated in the drawings, and specific language will be used herein to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Alterations and
25 further modifications of the inventive features illustrated herein, and additional applications of the principles of the inventions as illustrated herein, which would occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

30 As illustrated in FIGs. 1-5, an air freshener or scent device, indicated generally at 10, in accordance with the present invention is shown for providing a desired and/or aesthetically pleasing scent, fragrance, aroma or neutralizing agent. Air fresheners are one example of a field that can benefit from the present invention. The air freshener 10 can be used in bathrooms, wash closets, vehicles, offices, bedrooms, etc. The desired scent can include, for example, floral, fruit, vanilla, berry, pine, etc. In accordance with one aspect of the present invention, the air

freshener 10 can include a flexible and resilient polymer body, such as a polymer gel. The polymer body can be elastic and coherent. Thus, the polymer body can be compressible under an applied force, and substantially returnable to an original configuration upon removal of the applied force. It has been found that the polymer gel provides desired characteristics of aesthetics, flexibility, longevity, substantially constant scent release, and containment. In accordance with another aspect of the present invention, the polymer gel can have a freestanding, self-supported, three-dimensional shape that does not significantly change as the scent is released. In accordance with another aspect of the invention, the air freshener 10 can grip or cling to a surface 14, without mechanical fasteners or additional chemical adhesives. As such, adhesion between the air freshener and the surface is primarily by mechanical and/or specific adhesion. The surface 14 can include windshields, dashboards, computer monitors, glass windows, mirrors, etc.

The air freshener 10 includes a scent portion 18 for providing the desired scent, indicated by arrow 20. The scent portion 18 can include a carrier material 22 with a scent material of the desired scent interspersed therein. The term "scent material" is used broadly herein to refer to a material that has a scent that can be discernable or smelled, or even a neutralizing agent. Thus, the scent can be an ascertainable smell used to cover other scents, or a neutral agent that eliminates odors or provides a fresher atmosphere. The scent material disperses or diffuses out of the carrier material 22 into the air or atmosphere where it can be detected, or where it can provide a discernable scent. It is believed that the scent material migrates or diffuses through and out of the carrier material or gel. The scent material can be high in volatile notes, or has high volatility and can vaporize or evaporate at low temperatures. The scent material can include a scented oil. For example, suitable scent material can include pine, berry, vanilla, apple, coconut, cherry, pina colada, etc.

The scent portion 18 and/or the carrier material 22 can include a polymer material, such as a polymer gel 26, forming a polymer body. The polymer body and/or polymer gel 26 can be elastic and coherent. Thus, the polymer body can elastically deform under normal conditions. The polymer body can be flexible and resilient, such that the body or gel can compress under an applied force (42 in FIG. 5), but can substantially return to its original configuration upon removal of the applied force. The polymer gel 26, or the polymer body, can have a freestanding, self-supported, three-dimensional shape. Thus, the polymer gel or polymer body can be consistent or solid enough to support or maintain its shape in a freestanding manner without a container. The three-dimensional shape can be any desired shape. The polymer gel 26 can be considered a solid material that is elastic and coherent, and thus flexible and capable of being

deformed, but without being flowable. Thus, the polymer gel 26 may have a sufficiently high molecular weight, and/or a sufficiently high viscosity, so that it is a non-flowable gel. In addition, the polymer gel 26 can be considered as stable. Thus, the polymer gel can be bendable, but otherwise substantially maintains its form. The polymer body or polymer gel can be characterized as a polymeric material in the glass state with substantially no macroscopic flow. The polymeric material can have a glass transition temperature greater than approximately 110 °F. The polymer gel 26 can retain its gel-like characteristic over time, without drying or cracking, and without becoming hard or brittle.

In one embodiment, the polymer gel 26 can include a polyurethane material or can be a polyurethane gel. The gel can be formed by combining a polyurethane material with a scented oil. Surprisingly, it has been found that such a combination provides a desired scent, but without staining or substantially leaking onto a surface. In addition, the scent portion 18 does not undergo a visually ascertainable physical change, such as drying out or cracking. Thus, the scented portion remains aesthetically pleasing.

In some embodiments, a scented oil and a polymerizable monomer can be combined, along with optional initiators or other reactants. Isocyanate reaction polymers have shown good results in connection with the present invention. For example, the polymer gel and scent material can be a urethane polymerization product of combining a scented oil with a polyether polyol, and then with a diphenylmethane diisocyanate (MDI) prepolymer. Therefore, in some embodiments, the scent material can be a scented oil which participates in the polymerization reaction between polymerization reactants. For example, essential oils such as terpenes and the like can be mixed with polymerization reactants, or even in place of some reactants. Without being bound by any particular theory, it is thought that at least some of the reduction or elimination in residue in the devices of the present invention result from at least partial replacement of mineral oils and/or polyols with scented oils such as those listed herein. Other suitable isocyanates can include, but are not limited to, tolylene diisocyanates, methylene diphenyl isocyanates, hexamethylene diisocyanates, prepolymers thereof, and the like. Those skilled in the art will recognize various other isocyanate reaction polymers, i.e. polyurethanes, which can be suitable for use in connection with the present invention.

Alternatively, the polymer gel 26 can include silicone, diffused polyurethane, polyvinylchloride (PVC), ethylene vinyl acetate (EVA), thermoplastic polyurethane (TPU), a polymer encapsulation fragrance delivery platform (PolyIFF®), thermoplastic elastomer (TPE), polypropylene, ethylene/methacrylic acid (E/MAA) copolymer, in which the MAA groups have been partially neutralized with lithium ions (Surlyn® Dupont), etc.

As a general guideline, the polymer gel 26 can be formed of an elastomer such as, but not limited to, urethanes (including polyester and polyether polyol/isocyanate polymerization products), polyacrylates, polybutadienes, ethylene propylene elastomers, silicones, natural and synthetic rubbers, styrene/butadiene block copolymers, and the like. In some embodiments, the polymer gel can be formed of a thermoplastic elastomer. Thermoplastic elastomers can be block copolymers such as polyurethanes, polyamides, copolyesters, and styrene-butadiene-styrene polymers. Other thermoplastic elastomers can be elastomer/thermoplastic blends such as ethylene-propylene-diene monomer in an isotactic polypropylene phase or nitrile rubber dispersed in a PVC phase. As used herein, "thermoplastic elastomer" refers to an elastomer which can be heated and processed like thermoplastic materials. Specifically, a thermoplastic elastomer can be heated to a melted or flowable state and then cooled, resulting in reformation of cross-linking and subsequent coherency without a substantial change in mechanical properties such as strength, flexural modulus, elastic modulus, etc.

As used herein, "elastomeric polymer" and "elastomer" may be used interchangeably and refer to a polymeric material which can be mechanically deformed and upon release returns to an original shape. A coherent elastomer is also non-flowable at or near room temperatures. Further, "cling" and "clingly" refer to a property of a polymeric material which imparts adhesion to most surfaces without a loss of coherency in the polymer. Typically, removal of an elastomeric polymer body with a clingy attachment surface from a substrate does not result in substantial deformation, including temporary deformation, during flexing of the elastomer and/or attachment surface. A clingy attachment surface can be provided directly by the polymer body or can be provided in a separate layer as discussed in more detail herein. Adhesion can occur via mechanical adhesion or specific adhesion. Specific adhesion refers to adhesion dominated, or entirely characterized, by secondary intermolecular forces, i.e. non-covalent bonds, although some covalent bonds can be formed.

Although the polymer gel 26 is freestanding and self-supporting, it is also flexible and resilient. Thus, the scent portion 18 and carrier material 22 can form a flexible and resilient structure or body that can be selectively deformed and can return substantially to the three-dimensional shape. In addition, the carrier material 22 and polymer gel 26 can be light transmissive in at least a translucent manner, as described in greater detail below.

The air freshener 10 can also include an attachment portion, grip portion or base 30, disposed between the scent portion 18 and the surface 14. Thus, the attachment portion 30 can act as a barrier between the scent portion 18 and the surface 14 to resist potential contact of the scent material with the surface and protect the surface. The air freshener 10 or attachment

portion 30 has a lower surface 34 that is disposed on and grips the surface 14. The lower surface 34 can be “tacky,” such that the air freshener 10 or lower surface 34 tends to cling to the surface 14 in a frictional fashion, as opposed to a chemical or adhesive manner, and without using mechanical fasteners. The lower surface 34 can be flat, or substantially flat, to provide a greater surface area to cling to the surface 14. Alternatively, the lower surface 34 can be contoured, or can include indentations, to reduce the surface area to facilitate removal of the device from the surface 14.

The attachment portion 30 can include a pad 38 that can be formed of, or can include, a material that provides a “clingy,” “tacky” or frictional quality. For example, the pad 38 can include a molded polyurethane material. It has been found that the polyurethane material provides a clingy or tacky quality that remains disposed on the surface. In addition, it has been found that such a polyurethane material typically can be disposed on the surface 14 without marring or otherwise chemically interfering with the material of many surfaces, such as vehicle dashboards. It will be appreciated that many surfaces, such as a vehicle dashboard, have a finished surface configured to be aesthetically pleasing and luxurious. Such surfaces can be formed of a plastic or leather material, and can be expensive to replace or repair. In addition, it will be appreciated that some surfaces are subjected to extreme conditions, such as heat and sunlight. It has been found that the polyurethane material typically clings to the surface 14 without chemically interacting with the material of the surface, or otherwise damage the surface. The polyurethane material of the attachment portion 30 forms a temporary non-chemical bond with the surface 14. The air freshener 10 or attachment portion 30 can be removed from the surface 14 without leaving behind any residue and without damaging the air freshener 10. In this manner, the air freshener 10 can be easily moved to any location the user desires. Because the air freshener or pad includes a polyurethane material, it can be easily cleaned with soap and water, and still retain its tackiness, and is thus reusable. The scent portion 18 can be formed or disposed on the pad 38 or attachment portion 30, and can extend therefrom.

The attachment portion 30 allows the air freshener 10 to be positioned in a desired location, and even re-positioned as desired. For example, the air freshener 10 can be re-positioned to be in sunlight, near a vent, or at an elevated location to facilitate or optimize scent release. Placing the gel in the sunlight can heat the gel, and is believed to increase scent release. Airflow from a vent can carry the scent throughout an area, and can also increase scent release. It is believed that the fragrance or scent can be heavier than air. Thus, positioning the air freshener at an elevated position increases the travel and dispersing of the scent. The air freshener can be positioned so that it avoids contact with other objects, such as clothes in a

locker, to avoid staining. In addition, the air freshener can be positioned in a safe location in a vehicle, so that it does not block a driver's view.

The scent and attachment portions 18 and 30, or the carrier material 22 and the pad 38, can form a flexible and resilient structure that can be selectively deformed, and can return
 5 substantially to its original shape or configuration. It is believed that selectively squeezing the carrier material can temporarily cause a greater amount of scent to disperse. Thus, a user can selectively deform the carrier material when a greater scent is desired, indicated by arrow 42 in FIG. 5.

The shape and size of the scent portion 18 can be configured to determine the amount or
 10 quantity of scent released. For example, the scent portion 18 can have a shape to maximize or control the surface area through which the scent can permeate. The scent portion 18 can be bulbous, semi-bulbous, semi-spherical, tear-drop, oval, oblong, etc. Thus, the attachment portion 30 can have a shape or profile to match the shape of the scent portion. In addition, the material and amount of the scent and the scent portion can be varied to determine the release of
 15 the scent. It will be appreciated that the shape or design of the scent portion can vary. For example, the air freshener or scent portion thereof may be shaped to resemble an animal, a flower, a star, a face, a gecko, etc. In addition, the air freshener can include means for increasing the surface area of the scent portion or carrier material, including for example, slots, gaps, grooves, indentations, divots, protrusions, fins, ribs, etc. For example, a plurality of
 20 alternating slots 46 and fins or ribs 50 can be formed in the scent portion 18, carrier material 22 or polymer gel. The slots 46 can extend into the carrier material and/or the ribs or fins 50 can extend therefrom.

The slots 46 can be sized so that they terminate before the pad 38, so that there is a
 portion 54 of the scent portion that remains continuous. It has been found that having the scent
 25 portion be a continuous structure resists the fins 50 from tearing away. The bottom of the slots can be curved to reduce stress concentrations and resist tearing.

The slots 46 can be used to receive an article or item, and to hold the article or item 56,
 as shown in FIG. 15. For example, the article or item can include a note, a business card,
 directions, etc. Thus, the scent device can be used to hold directions while driving.

30 Alternatively, the scent device can be shaped and configured to hold other items, such as the bridge of eyeglasses or sunglasses, compact discs (CDs), etc.

A barrier 58 can be disposed between the scent and attachment portions 18 and 30, or the carrier material 22 and the pad 38. The barrier 58 can be a layer of material that is heat and oil resistant, such as a nylon, TPU, polyester, or polypropylene sheet, or other synthetic material.

The barrier 58 resists migration, leaking or leaching of the scent material or scented oil into the pad 38, and thus to the surface 14. Thus, attachment portion 30 or pad 38, and the barrier 58, act to resist any staining of the surface 14 resulting from scented oil leaking therethrough. It has been found, however, that the scented oil surprisingly does not leak from the scent portion and/or cause stains. It is believed, however, that the polyurethane material of the attachment portion 30 or pad 38 may be susceptible to leaching depending on the scent oil used. Thus, the barrier 58 is intended to resist such leaching. The barrier 58 can be smaller than the attachment portion 30 and scent portion 18 in order to leave a perimeter attachment portion 25 extending around a perimeter thereof so that the scent portion 18 can attach directly to the attachment portion 30.

The air freshener 10, including the attachment portion 30 or pad 38, can be flexible and capable of bending to conform to curves or details in a curved surface 14b, as shown in FIG. 5. The attachment portion 30 or pad 38 also can have a planer configuration and can be used on planar surfaces. The air freshener 10 can be provided with a backing or release layer that prevents or resists the pad 38 from sticking or clinging to any wrapper or packaging of the air freshener. The release layer can include indicia thereon, such as instructions for use and care of the air freshener. The release layer can protrude beyond a perimeter of the pad 38, such as with a tab, to facilitate removal of the release layer from the air freshener. A removable wrapper can be formed around the air freshener to protect the air freshener prior to use. The wrapper and backing layer can be removed prior to placing the air freshener on the surface.

The air freshener 10 can include indicia 62 (FIG. 2) disposed on an outer surface of the air freshener 10 or scent portion 18. The indicia 62 can include artwork, a logo, an advertisement, an instruction, a brand, a trademark, etc. The indicia 62 can be formed by printing on the outer surface, molded into the material of the outer surface, etc.

As described above, the air freshener 10, scent portion 18 or gel can be light transmissive in at least a transparent manner. Thus, the scent portion or gel can be transparent or translucent. Indicia 66 (FIG. 1) can be disposed beneath or behind the scent portion 18, and visible therethrough. Thus, the scent portion 18 can protect the indicia 66 from wear. In addition, the use of a translucent or transparent gel material and the shape of the scent portion can provide a unique visual appearance. Again, the indicia can be a logo, an advertisement, an instruction, a brand, a trademark, etc.

A light color can be disposed behind the scent portion 18 or carrier material 22 to cause the translucent or transparent material to have a luminescent or brighter appearance. For example, the barrier 58 can have a light color, such as white.

The air freshener 10 can be utilized as a promotional device to promote products or services. For example, the indicia 62 and/or 66 can include a logo or trademark for a product, service, business, etc. A method for utilizing the air freshener and/or for promoting includes providing such an air freshener with indicia on or in the air freshener that is indicative of the promotion. Such an air freshener 10 can be given away as a promotional item. A user can then install the air freshener 10, such as in his or her car, thus positioning the indicia in a location where it will be frequently visible.

A method of using the air freshener 10 described above includes removing the air freshener 10 from any wrapping, and/or removing any backing layer from the pad. The air freshener 10 can be attached to a surface 14 by placing the pad 38 against the surface so that the pad clings to the surface. The surface 14 can be any desired surface, such as an interior surface of an automotive window, an automotive dashboard, a bathroom mirror, etc. The scent from the scent portion 18 or polymer gel can disperse or permeate from the scent portion or polymer gel. The air freshener 10 can be disposed in a location subject to heat and/or sunlight, such as an automotive windshield or dashboard. The heat from the sunlight or a heat vent can facilitate the release of scent from the scent device. In addition, airflow from the heat or vent can assist in dispersing the scent. In addition, the air freshener 10 or polymer gel of the scent portion 18 can be flexible and can be pressed, causing the scent portion or gel to deform and to release scent. The pressure can cause the scent to mix and move to the surface of the scent portion.

Referring to FIGs. 6 and 7, a method for providing an air freshener is shown. The method includes combining a scent material with a polymer body, such as a polymer gel. The polymer material or polyurethane can be combined with a scented oil. In some embodiments, the scented oil can cause the polymer material to gel. For example, the polymer body or polymer gel can be a polymerization product of the scented oil, polyether polyol, and diphenylmethane diisocyanate (MDI) prepolymer, although other polymerization reactants can also be used. The scented oil can be combined with the polyether polyol. The diphenylmethane diisocyanate (MDI) prepolymer can be combined with the polyether polyol and scented oil to form the polymer gel. For example, a pine scented oil can be combined with a polyether polyol so that the polyether polyol has approximately 40% pine scented oil content. The polyether polyol (with the 40% pine scented oil content) can be added to the diphenylmethane diisocyanate (MDI) prepolymer on a 2:1 ratio, or 2 parts polyol to 1 part prepolymer.

The polymer gel is configured into a desired shape. For example, a material 70 of the scent portion 18, such as the polymer gel, can be poured in a mold 74 with cavities formed in a desired shape. In addition, the air freshener can also be provided with a pad. A material 76 of

the pad 38 can be poured in over the material of the scent portion. Pouring one material onto the other can cause the two materials to bond or adhere to one another. Alternatively, the two portions can be separately molded and attached with adhesive. The barrier can be positioned prior to pouring one material onto the other. In addition, the device, or portions thereof, can be made by injection molding.

It will be appreciated that the air freshener 10 can be configured or shaped to appear as various different objects. The shape or configuration of the scent device 10 can provide an aesthetic pleasing appearance. For example, the shape and appearance of the scent device can differ significantly from traditional air fresheners. Other air fresheners often have a utilitarian appearance, such as cans or canisters, while others have an appearance associated with air fresheners. Thus, the air freshener 10 of the present invention can have a shape and appearance not typically associated with air fresheners. For example, the air freshener 10 can have a substantial appearance and shape of an insect or bug, as shown. Various surface treatments, such as the ribs or slots, can add to the appearance, such as by adding strips, etc. In addition, the air freshener or carrier material can have a color that adds to the appearance. It will be appreciated that other shapes or appearances are possible. For example, the air freshener can be configured to blend in with the environment in which it is used. For example, the scent device can be shaped and configured to appear as a button to blend in with a dashboard. Alternatively, the air freshener can be shaped, sized and colored to stand out, and act as a promotional device or advertisement. For example, the air freshener can be shaped as a logo of an automobile manufacturer.

In addition, one or more air fresheners can be provided as collectables. For example, the air freshener can be shaped, configured or printed to indicate a commemorative event, such as a business anniversary, a holiday, etc. As another example, a plurality of different air fresheners can be provided in families or groups, with each air freshener having a different size, shape, and/or color, as shown in FIG. 16. As another example, a plurality of different air fresheners can be provided with different shapes that fit together or coordinate to form another object, such as a flower, etc, as shown in FIG. 17. The air fresheners 78 can include mating protrusions 78b and recesses 78c, so that the air fresheners can be fitted together to form another object or design.

As described above, various indicia can be provided with the air freshener. Such indicia can be molded or printed on the top of the air freshener or on the scent portion. The scent portion or gel can be translucent or transparent, and indicia can be provided on the barrier, or on the top surface of the pad. Thus, the indicia is visible through the scent portion or gel. The air

freshener can be placed, such as on a windshield, such that the scent material or gel appears to light or glow when light shines through it. The pad and barrier can also be translucent or transparent so that the entire air freshener can be translucent or transparent, and so light can shine through the entire air freshener. As described above, the barrier 58 or other reflective material can be disposed behind or beneath the scent portion or gel to reflect light.

In addition, a phosphorescent material can be provided in the base or the scent portion so that the air freshener, or portion thereof, luminesces or glows. In addition, the indicia can include a phosphorescent material. Furthermore, another material can be added to the scent portion or gel that causes the scent portion or gel to change colors due to changes in temperature or light. For example, the scent portion or gel can be one color in the sunlight, and another color in shadows or darker conditions.

In addition, the air freshener can include an end-of-life indicator when it is time to replace the air freshener. The useful life of the scent device can vary, and can be a typical period, such as 30 days. For example, the air freshener or scent portion can include a material that changes color or other characteristic over time. For example, the air freshener or scent portion can change from translucent or clear to opaque. Alternatively, the air freshener or scent portion can change from opaque to translucent or clear. Indicia, such as "time to replace," may be provided under the scent portion so that the indicia becomes visible over time. Alternatively, the air freshener or scent portion can change from one color to another.

In addition, the air freshener can be sized to conform to non-choking requirements, and can be formed from non-toxic materials. Furthermore, the air freshener or portion thereof can include a material that is bitter to the taste to discourage individuals from placing the device in their mouths.

Referring to FIG. 8, another scent device or air freshener 10b is shown that is similar in many respects to that described above. The air freshener 10b includes a carrier material 22b similar to that described above, such as a polymer body or a polymer gel with a scented oil therein. The air freshener 10b can also include a hanger 80, such as a string, wire, clip, etc. from which to suspend or hang the carrier material 22b or polymer gel. As described above, it has been found that the polyurethane gel is capable of substantially maintaining its form. In addition, it has been found that the scented oil surprisingly does not leak from the polymer gel and/or stain surfaces. Thus, the air freshener 10b can be suspended or hung as desired.

Referring to FIGs. 9-11, another scent device or air freshener 10c is shown that is similar in many respects to those described above. The air freshener 10c can include a scent portion 18c disposed on an attachment portion, grip portion or base 30c. The scent portion 18c can include a

carrier material 22c, similar to those described above, and the base 30c can include a tray 90. The carrier material 22c can be similar to that described above, a polyurethane gel with a scented oil. Alternatively, the carrier material can include a scented plaster. The tray 90 can include a depression or indentation 94 therein formed by a perimeter lip 96 extending around the tray. The tray 90 can be formed of nylon, and can act as a barrier between the scented portion 18c or carrier material 22c and the surface 14. An attachment means can be disposed on the bottom of the tray 90 to attach or secure the tray to the surface 14. The attachment means can include a polyurethane material 98 to frictionally grip the surface 14, as described above. Other attachment means can be used, including for example, adhesive, tape, hook-and-loop type fasteners, etc.

A button 102 can be utilized to secure the scent portion 18c or carrier material 22c to the tray 90 and/or to provide a visible surface 104. The visible surface 104 can be formed in the proximal end of the shaft and can be formed on an enlarged head capable of receiving indicia thereon. The indicia can include logos, advertisements, instructions, warnings, etc.

The button 102 can include a shaft 108 that extends through a bore or hole 112 in the scent portion 18c or carrier material 22c. A distal end 116 of the shaft 108 can be secured to the tray 90, such as in an indentation 118, in any appropriate manner, including sonic welding, press fit, mating screw threads, snap fit, etc. The button 102 can permanently or temporarily secure the scent portion 18c or carrier material 22c. The entire air freshener can be disposable, or the scent portion 18c can be removed and replaced.

The air freshener can be round or oblong, and can have a partially bulbous shape, or a partially spherical shape. The scent portion 18c or carrier material 22c can include an indentation or recess 122 to receive the button 102 or head thereof. Thus, the button or head can be flush or substantially flush with the scent portion 18c.

Referring to FIG. 12, another air freshener 10d is shown that is similar in many respects to those described above. The air freshener 10d can be configured to maximize or control the amount of scent dispersed. The scent portion 18d or carrier material 22d can have a hollow interior or cavity 130 with an interior surface to maximize the surface area of the scent portion 18d or carrier material 22d, and thus the amount of scent released. In addition, interior ribs or fins 134, and/or grooves or channels, can be formed in the scent portion 18d or carrier material 22d. A gap 138 can be formed between the scent portion 18d and the head of the button 102d. The gap 138 can extend to the cavity 130. Thus, the scent from the hollow interior can be released through the gap.

The button 102d can be adjustably coupled to the tray 90d, and selectively movable with respect to the tray. For example, the button 102d can be coupled to the tray 90d by mating screw threads. Alternatively, the button 102d can snap between two or more positions. Thus, the button 102d can be selectively positioned with respect to the tray, and the size of the gap 138 can be selectively adjusted, to selectively control the amount of scent released.

Referring to FIG. 13, another air freshener 10e is shown that is similar in many respects to those described above. The tray 90e can include a protrusion extending into a cavity on the button 102e.

Referring to FIG. 14, the carrier material or polymer gel of the present invention can disperse at a substantially constant rate, or can have a substantially constant or linear scent release over time. The scent release can be determined by measuring the weight of the device over time. As scent is released, the scent material disperses out of the carrier material, reducing the weight of the carrier material. As shown in FIG. 14, the scent release or weight reduction can extend substantially linearly over time, represented by solid line 150. The carrier material and scent can be formulated to release a substantial amount of the scent material in a predetermined time period, such as between 2 to 30 days. The dashed line represents typical prior art air fresheners that quickly release scent.

Referring to FIG. 18, another air freshener 10f is shown that is similar in many respects to those described above. The air freshener 10f can be shaped and sized, or the carrier material 22f or gel can be formulated, to be substantially flexible or bendable. For example, the air freshener can be relatively thin, and can readily conform to a surface 14c that also can be curved. Thus, the air freshener can have a thin polymer body. The thin polymer body can be flexible and conformable, but resilient and returnable to its original configuration. The air freshener 10f or carrier material 22f can have an attachment surface 160 for attachment to a surface, such as glass. The attachment surface 160 can be tacky or clingy so that it can cling to the surface without chemical adhesives or mechanical fasteners, as described above. Thus, the air freshener 10f can be a simple device capable of being removably secured to a surface, such as a windshield or mirror. In addition, the air freshener 10f can include a support surface 164 configured to hold or support another object 168, similar to that described above. The support surface 164 can also be tacky or clingy to cling to the other object.

It is to be understood that the above-referenced arrangements are only illustrative of the application for the principles of the present invention. Numerous modifications and alternative arrangements can be devised without departing from the spirit and scope of the present invention while the present invention has been shown in the drawings and fully described above with

particularity and detail in connection with what is presently deemed to be the most practical and preferred embodiments(s) of the invention, it will be apparent to those of ordinary skill in the art that numerous modifications can be made without departing from the principles and concepts of the invention as set forth in the claims.